Spreading the risk

T he central issue of spreadsheet risk is the danger posed by the prolific use of unregulated spreadsheets in mission-critical applications throughout all industries. This is a major concern for banking and finance. In the domain of operational risk, in particular, organizations are striving to cope with regulatory and compliance pressures brought about by the likes of Sarbanes-Oxley and Basel II.

In July 2006, the seventh annual conference of the European Spreadsheet Risk Interest Group (Eusprig) showcased the impact that spreadsheet risk can have across industries and highlighted the growing seriousness of the problem.

Problems arising from poor programming, error-prone construction, lack of documentation or evidence of testing, and few controls on data and structural integrity are rampant in many spreadsheets used in critical operations across organizations of all sizes.

YUSUF JAFRY EXPLAINS WHY SPREADSHEETS CAUSE AS MANY PROBLEMS AS THEY SOLVE, AND LOOKS AT WHAT IS BEING DONE TO LOWER RISK LEVELS SO THAT SPREADSHEETS CAN REMAIN A POWERFUL YET FLEXIBLE TOOL IN THE COMPUTING ENVIRONMENT.

A recent review presented by Ray Panko of the University of Hawaii, a leading authority on spreadsheet risk, suggests that more than 80% of corporate spreadsheets contain serious material errors. This is particularly prevalent where the spreadsheets have evolved organically over many years with input from many different analysts.

Unfortunately, it is not only human error which poses a risk. Spreadsheets are wide open to malicious or fraudulent use. Perhaps a classic case of spreadsheet risk is that of rogue US trader John Rusnak. By fraudulently tampering with his own spreadsheets, he was able to accumulate trading losses of over $600 M.

In addition to the inherent risks they pose, spreadsheets are costly to operations because their usage commonly results in the stranding of vital data onto decoupled 'islands', often unreachable by the central IT infrastructure. The consequence of data existing in spreadsheet silos are the multiple entry of data (which has its own associated risks), delayed reporting and simply a lack of knowledge as to what is really going on in the business.

THE CORE OF THE PROBLEM By their nature, spreadsheets are simple to create with no special programming knowledge required. And that is the core of the problem. Spreadsheets written by non-programmers (and even by non-specialists) are used across industries, effectively uncontrolled by management.

Moreover, until recently, regulatory bodies and corporate IT departments have traditionally passed the buck. They peddled the line that spreadsheets were merely temporary prototypes dreamt up by the business units and a useful tool for analysts to play with, but occupying no place in the enterprise's computing infrastructure.
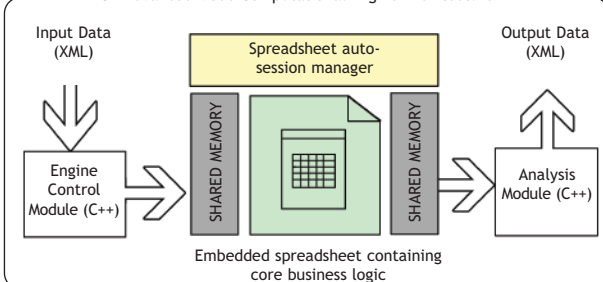

Figure 1. A computing framework for the robust and secure use of spreadsheets within an enterprise.

A computational cluster comprising a parallel bank of servers enables scalability and robustness. On each computational server, an auto-spawned spreadsheet session is embedded within a (C++ coded) computational framework via shared memory, with XML based input/output data feeds to/from the application layer via queued messaging.

Computational cluster hosting spreadsheet automated sessions

Message queue (XML) "job" management (from ESP Application Layer)

ESP Advanced Mode Computational Engine Architecture

Input Data (XML)

Spreadsheet auto-session manager

Output Data (XML)

Engine Control Module (C++)

SHARED MEMORY

SHARED MEMORY

Analysis Module (C++)

Embedded spreadsheet containing core business logic

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EXECUTIVE SUMMARY

- Spreadsheets enable experts and non–experts alike to engage in complex operations with relative flexibility and ease. The downside is an increased risk of error and fraud.

- Solutions to these problems are emerging in the form of software development, better availability of auditing, tracking and testing tools, and a growing focus on industry best practice.

The spreadsheet was traditionally viewed as a stopgap solution that would be discarded as soon as the proper system was rolled out. But often that never happened. The technical challenge of creating a solution that matches the flexibility and user acceptability of the spreadsheet is simply too great. Spreadsheet replacement often involves a long, difficult translation into another language.

For example, the new Basel II regulatory framework encourages banks to build complex internal credit risk models to reduce their regulatory capital requirements. These models are complex, detailed, deal-specific, and require specialist business knowledge from seasoned practitioners. They are invariably written in spreadsheets and cannot be transcribed to systems such as C++ without a near-complete loss of flexibility and business agility. If the models do get transcribed, it is often a difficult process for the original creator of the analytics to make any changes to it.

Not surprisingly, there is widespread and continuously growing dependence on spreadsheets for enterprise-level applications, with no parallel plan to ever build the corresponding proper systems.

EMERGING SOLUTIONS Software suppliers are responding to the market's need for improvement in the use of spreadsheets within the enterprise. Microsoft has introduced significant improvements to Excel, released with the Office 2007 suite in late January 2007. Part of the problem, as the Microsoft Office program manager recalled at Eusprig, is that Excel was never intended to act as an enterprise platform. It was designed as a simple and convenient desktop tool for users to play around with. It is, in a sense, a testament to the usability of the spreadsheet paradigm that Excel has come to dominance as the business analyst's tool of choice for 'programming'.

In response to this unforeseen market reality, and as part of the new functionality, Excel 2007 can be securely managed and run on central servers, accessible from external applications via programmable web-service interfaces. The spreadsheets themselves can thus be locked down and secured.

Risk Integrated also utilizes this lock down approach. In our system the spreadsheets are embedded within a server-based computational engine, completely removed from end-users. The data layer is separated from the logic layer, so the users can modify the input data, run it against the spreadsheet model, and then send the results to the enterprise reporting layer. All this is done without ever having access to the underlying spreadsheet. Only the designated expert superusers in the organization are authorized to manipulate the spreadsheet. Even the superusers only have access to the spreadsheets via a tightly controlled, enterprise database-driven versioning system (see Figure 1).

As an alternate line of attack, other companies offer solutions that focus on auditing, tracking, and testing tools for mitigating the risks associated with authoring and maintaining spreadsheets. For example, auditing tools are available which monitor any changes made to the spreadsheet, alerting management if necessary, when a formula in a cell is changed.

There is even a fledgling movement to establish industry best practices for authoring and maintaining spreadsheets, borrowing from the ideas more usually associated with professional software programming.

An example of this is the 'four eyes principle' (borrowed from the tenets of Extreme Programming) whereby the internal policy of an organization dictates two programmers are required to work together whenever any changes are made to the spreadsheets. Although burdensome to enforce and often unappealing to the individuals concerned, this technique can substantially reduce the amount of errors creeping in.

Together, these various technical and policy approaches are enabling spreadsheets to claim a legitimate place in the enterprise computing environment, without forgoing the flexibility which makes them invaluable.

The regulators are also responding positively. A senior technology reviewer from the FSA now recognizes the role of spreadsheets in banks' strategic planning. With appropriate management and infrastructure, spreadsheets are here to stay—and that is a good thing.

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